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Abstract

STRUCTURE AND PROPERTIES OF TERNARY ALLOYS CONTAINING THORIUM

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Described are the experimental data obtained by the authors on the structure of ternary alloys containing thorium in the systems thorium-zirconium-titanium, -trorium--zirconium-cerium, thorium-zirconium-molybdenum, thorium-zirconium-niobium. Consideration is given to the study of metastable phases, conditions of their formation and relation to the properties of alloys. Information is provided on the hardness of alloys hardened from the β -hard solution and tempered at 100-600°C.

In the system thorium-zirconium-cerium no wide region of hard ternary solutions based on the body-centered cubic lattice of β -zirconium was observed.

The elements of diagram were plotted for the state of the thorium-zirconium-cerium system in the temperature range from 930°C to the room temperature.

In the thorium-zirconium-molybdenum system a region of ternary $B_{Th-Zr-Mo}$ hard solution on the basis of the body-centered cubic lattice was observed at 1,000°C. A region of the alloys of this solution has been established in which at high temperature hardening, alongside with the body-centered cubic lattice a W-phase resul-

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ting from a partial martensite transformation was observed.

The alloy systems thorium-zirconium-molybdenum and thorium-zirconium-niobium hardened from the region of a hard solution on the basis of a body-centered cubic lattice of β -zirconium were studied to show how the rate of cooling at hardening effects the formation of a W-phase. A decay process of β -phase in these alloys tempered at 100-600°C has also been studied.